GeoCommunicator
Project Planning Document

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1.0 Project Overview

1.1 Project Description

Name of Project	GeoCommunicator
Sponsor (Name, Title, Program/office)	Jack Arthur, Director, IRM and Jack Craven, Director, Lands, for the Forest Service. Hord Tipton, Assistant Director, IRM and Pete Culp, Assistant Director, Minerals, Realty & Resource Protection, for the Bureau of Land Management.
Direct Beneficiaries	Cadastral Surveyors and Land Management Specialists
Products	Internet-based, data sharing and communicating software.
Justification	Data collection among all levels of government, non-profit organizations and private industry continues at a pace that exceeds our ability to track collection of similar data, share data or form partnerships to cooperatively collect and maintain data. Common data standards have been established, yet do not insure common access or collection partnerships. A significant amount of this data is information related to a point or area on the earth's surface. As data requirements and the demand for land-related information increase, the magnitude of these shortcomings will escalate. The GeoCommunicator would be a solution: Through an Internet-hosted graphic map interface, a customer would discover what information is available or planned for collection within a selected geographic extent across multiple data sources. The customer would discover the geographic extent of a specified type of existing information and see locations of planned activities concerning that type of data. Access to data stores would be provided through the Internet's URL links or through points of contact. An automated notification service would be offered that would alert the customer to modifications and/or additions to certain types of information and specified activities within a selected geographic extent. With GeoCommunicator, users and customers would have an efficient, standard means of data sharing, task/project planning and communication. Missing data, inconsistencies and inaccuracies would be minimized; timeliness in reporting, customer satisfaction and customer confidence would increase.
Return on Investment (ROI) ratio.	1.1

1.2 Project Purpose

1.2.1 Project Objective

Develop an Internet-based set of tools which would provide land management specialists with

the capability of sharing information about data and activities. Provide users with Internet-based navigational and search tools to discover information about their project needs. Eliminate/reduce redundant collection and maintenance of resource data.

1.2.2 Compliance with Laws

1.2.2.1 Clinger-Cohen Act.

- Land management business practices and requirements specific to land management are currently, but not totally and concisely implemented in software. This minimizes the use of Commercial, Over-the-Counter Software (COTS). GeoCommunicator teams would cooperate with a prominent GIS software development contractor to take advantage of existing functionality and to develop additional functionality to create a state-of-the-art data sharing and communicating system.

- The GeoCommunicator Project's new business processes would support the BLM goal of developing a common solution for BLM, the Forest Service and their partners for the business processes involved with the management of cadastral land records.

1.2.2.2 Government Performance and Results Act (GPRA)

- The GeoCommunicator efforts are aligned with the BLM Strategic Plan.

- The implementation of GeoCommunicator would improve the accuracy of land data reporting thus reducing technical and legal risks and would develop a higher level of customer confidence.

- GeoCommunicator conforms to the BLM mission statement by providing the best practices of managing the public lands.

- GeoCommunicator has been initiated and would be tracked to completion using state of the art management practices.

- Results would be measurable - consistency of data, efficiency, paperwork reduction, customer satisfaction.

1.2.2.3 Paperwork Reduction Act (PRA)

- By digital automation of land management data sharing practices, the manual practices of sharing raw data, paper records and maps would be minimized and/or eliminated.

- Data retrieval and analysis would be performed in a GIS environment.

- ❖ Communication of task plans, needs and specifications would be carried out via Internet methods.

1.2.2.4 Rehabilitation Act of 1973.

See Section 4.2, Requirements Description.

1.3 Summary of Project Management Information

1.3.1 Project Management

The Project Manager is Leslie Cone with the Bureau of Land Management, located in the Denver Federal Center, Building 40. Mailing address is: Leslie Cone, Building 50 WO-510, Denver Federal Center, Denver, CO 80225-0047. The Project Manager may be reached at 303-236-0815 or by e-mail at Leslie_Cone@blm.gov. This project is documented on the World Wide Web at www.blm.gov/nils.

An object-oriented analysis and design (OOAD) method was used to capture the essential business process requirements that would be supported by the GeoCommunicator software application. The analysis, build and review phases of the GeoCommunicator project would also follow OOAD principles. Project management of GeoCommunicator is based upon the concepts of Managed Evolutionary Development (MED) and would follow these concepts throughout the life of the project. Resources and scheduling would be tracked throughout the life of the project using a Work Breakdown Structure (WBS) and a Gantt chart. Other project management techniques applied to the project would include forms of Life Cycle Management (LCM) and Uniform Modeling Language (UML).

The functional requirements for GeoCommunicator have been approved by the Chief Cadastral Surveyor, represenatainves of the GTAG Committee, Lands Program Leads and the System Owner.

1.3.2 Project Schedule Overview

Approval to proceed with the Design phase of GeoCommunicator was granted by the ITIB in April, 2000. In this phase, the business rules, business requirements and functional requirements were to be used to complete a prototype and proof-of-concept design by September 2000. In July, 2000, ESRI announced a COTS product (GeographyNetwork) which fulfills most of the requirements of GeoCommunicator. This greatly reduces the BLM's project efforts. Requirements which were not addressed in ESRI'' product are being developed separately and will be accessed as a link from GeographyNetwork. The GeographyNetwork/GeoCommunicator software is scheduled for completion in FYQtr2, 2001.

A basic requirement of the GeoCommunicator development is to ensure that the functional requirements are compatible with ESRI's latest version of their COTS. GeoCommunicator is being developed in parallel with ESRI's Arc Internet Map Server module.

A high level Gantt chart of the GeoCommunicator schedule is in Section 6.1.2.1 of this document.

The GeoCommunicator milestones are listed in the following table:

Phase	Milestones	Date
Initiation	Partnership Agreement	6/11/98
Design	Completion of Requirements Document	3/00
	ITIB Approval for Design.	4/13/00
	Proof of Concept, Cycle 1	7/17/00
	ITIB Approval for Analysis, Build, Review Cycles	8/22/00
Analysis/Build/Review	Demonstration of Proof of Concept.	Not applicable due to release of COTS.
	Development and Test Cycle 1	
	Development and Test Cycle 2	
	Development and Test Cycle 3	
Transition and Deployment	ITIB Approval for Deployment	
	Deployment	1/31/01
Operations and Maintenance	GeoCommunicator close-out	2/1/01

1.3.3 Project Budget/Resources Overview

GeoCommunicator Cost Summary	
Shared H/W and S/W Support, Maintenance and Licensing Costs	$197,648.64
BLM Support Labor Costs	$1,075,938.84
Contractor Labor Costs	$460,775.00
Training	$25,000.00
Travel	$57,007.95
Hardware Purchases	$37,519.00
Software Purchases	$32,125.04
Total System Life Costs	$1,886,014.47

1.3.4 Project Documentation Plan

Document Name	Date completed/Updated
Partnership Agreement	June 11, 1998
Project Charter	March 9, 1999
Vision Document	September 22, 1999
Project Plan	September 22, 1999
Managed Evolutionary Development	January5, 2000
Project Gantt Chart	January5, 2000
Work Breakdown Structure	January5, 2000
Security Plan	
Requirements Tracebility Matrix	7/2000
Test Plan	7/2000

2.0 System Boundaries

2.1 Scope of Project

2.1.1 Targeted business processes

2.1.1.1 Existing Business Processes

- Manually find information, references and existing data for an assigned task.
- Review and study located information.

- ❖ Communicate with interested parties and co-workers concerning tasks and problems; request information from the same.

- ❖ Share data with interested persons via various media and in various formats.

- ❖ Store and maintain business data on paper, in data bases and in various record keeping systems.

- ❖ Communicate with interested parties concerning data and tasks.

- ❖ Maintenance of communications by individual; group communications.

2.1.2 Function
Provide the means to locate and retrieve cadastral and land management data (maps, surveys, scanned documents, GIS coverages, text documents, etc) which is related to current business processes. Communicate with other professionals to gather/share business task-related information.

2.1.3 Intended Customers/Users
Federal, state, county, local government land and resource management departments; GIS managers; professionals with requirements for public land data.

2.1.4 Geography
GeoCommunicator would be an Internet-enabled set of tools. Its area of use will be limited to the fifty states.

2.1.5 Business Sites
Federal, state, county, local government land and resource management offices and public land management concerns.

2.1.6 Interfaces with other Systems/Processes
GeoCommunicator would provide a URL indexing system to NILS data which would be derived from the following: LR2000, AFMSS (Automated Fluid Minerals Support System), ALIS (Alaska Land Information System), GLO (Government Land Office) records, Cadastral survey, field notes and Index of Field Notes

2.1.7 Other existing or similar systems
There are no known web-based systems that provide land activity planning and support data collection partnerships.

2.1.8 Other components where any potential ambiguity may introduce scope creep.
The GeoCommunicator process to submit data and activity plans is intended to provide a "footprint" of where the data or plans exist and a link to them.. GeoCommunicator will not store the data.

2.1.9 Risk Management

Functional Category	Functional Requirement	Technical Uncertainties	Risk to Project
Data Input	Post planned land activities and comments.	Degree of customization necessary for a planning/scheduling components beyond common core functionality	Could effect customer satisfaction if agencies are not able to post planned activity
Search for Data	Register for updates	No known technical uncertainties for this web-based, browser-based application	Could effect customer satisfaction if providers donot maintain current information.
Ensure accuracy, customer satisfaction.	Provide a Quality Control process	Degree to which a QC mechanism could be provided that would accommodate various data types	Could effect data providers' ability to conform to a data standard usable by GeoCommunicator
Provide data and activity catalog	Provide a tool set to manage and contain data and activity plans.	Degree to which a common tool set, usable by differing database technologies, could be developed to make posting of data and activity catalog easy.	Could effect data providers ability to easily post data and activities.
	Provide links for non-cooperators data	No known technical uncertainties to providing data access	
User Interface	Provide a Web-based Spatial Map interface	Degree of integration of data into a seamless dataset ready for query and mapping activities from a diverse group of data providers	Could effect customer service if query and display is limited to a few geo-related areas and activities
Data Output	Provide URL links to non-cooperators data and activities.	No known technical uncertainties for providing HTML links to data	Could effect user confidence and satisfaction if links fail.
	Provide data query & display capability	Degree of maintaining acceptable performance when accessing data from various sites to present a spatially continuous view "across the landscape"	Could effect customer service if query and map display response times exceed expectations
	Provide a tool set for identifying data stewards	Degree to which a common tool set could be developed to accommodate various hardware/software suites	Could effect fostering of new partnerships if data stewards can not be identified
Security	Provide a security module	Degree to which firewall configurations and various security policies effect data access	Could effect customer service if users encounter frequent denials in data access
Customer Notification	Provide automated email notification to subscribers	No known technical uncertainties for this web-based, browser-based application	Would effect reliability if notification process fails.

Functional Category	Functional Requirement	Technical Uncertainties	Risk to Project
	Provide a process that scans for updates to data/metadata and initiates the automated email process	Degree to which the "scan for updates" mechanism can accommodate differing data formats	Could effect data providers ability to provide data in a usable format for the automated email notification process

2.2 Project Completion Criteria

Milestones/ITIB Approvals	Completion Criteria	Approved By	Date
Partnership Agreement	Commitments by sponsors to proceed with project.	Project Sponsors	6/11/98
Completion of Requirements Document	Finalized Business and Functional Requirements	Dennis McKay, GTAG Representative Bob Ader, CO, WO Lands and Realty Don Buhler, Chief Cadastral Surveyor Robert DeViney, ORSO Chief, Branch of Realty and Record Services; Group Manager, WO-350 Lands and Realty; Pete Culp, AD, WO Minerals, Realty, & Resource Protection	3/00
ITIB Approval for Design.	Successful completion of requirements phase.	ITIB	4/13/00
Proof of Concept (POC), Cycle 1	Construction of POC/Prototype		
ITIB Approval for Analysis, Build, Review Cycles	Construction of POC/Prototype		8/22/00
Demonstration of Proof of Concept.	Succesful demonstration of GeoCommunicator POC/Prototype		Not Applicable due to requirements contained in COTS as of 7/00

Milestones/ITIB Approvals	Completion Criteria	Approved By	Date
Development and Test Cycle 1	Iterative development of final version of GeoCommunicator		Not Applicable due to requirements contained in COTS as of 7/00
Development and Test Cycle 2	Iterative development of final version of GeoCommunicator		
Development and Test Cycle 3	Iterative development of final version of GeoCommunicator		
ITIB Approval for Deployment	Successful final version construction.		
GeoCommunicator close-out	Successful Deployment and completion of O&M.		2/1/01

2.3 System Boundary Changes

Changes since first version of MED document	Approved By	Date of Approval
ESRI introduced an Internet based data sharing COTS which contained most of the GeoCommunicator requirements. The remaining GeoCommunicator requirements were developed as link from GeographyNetwork.	Project Manager	7/00

3.0 Target Business Processes

3.1 Supporting Documents

Document Citation	Date	Information Content	On Web Site?
Geographic Measurement Management User's Manual and other documentation.	2/28/00	Geographic Coordinate Database and cadastral survey spatial information processes.	http://www.spatial.maine.edu/~kwurm/
BLM land management business process procedures.		Business rules and functional requirements for land management.	No

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Document Citation	Date	Information Content	On Web Site?
NILS Concept of Operations and User Requirements document.	3/00	Project requirements which would drive analysis/build /review phase.	http://www.blm.gov/nils
BLM IT Architecture vs. NILS Essential Elements Cross-walk.	3/14/00	Comparison of BLM IT Architecture and NILS proposal	No.
Draft Business Process to Strategic Plan Comparison	3/10/00	Comparison of NILS business processes with BLM business processes	No.
Manual of Surveying Instructions	1973	BLM surveying business rules	No

3.2 Target Business Processes

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
Manually find information, references and existing data for an assigned task.	❖ Create process to find data references, reference documents and events. ❖ Establish or modify search parameters that define a research scope and submit query. Example parameters include: ❖ data category; ❖ event category; ❖ spatial extent; ❖ logical operators; ❖ temporal constraints; ❖ reference document category ❖ Subscriber may opt to save search parameters for re-use at a later time.	GC01. Conduct Research	Federal, state, county and local government land management specialists; private concerns	Most Critical	❖ Provide an easy to use interface. ❖ Data sharing. ❖ Readily available data. ❖ Many sources of data ❖ GIS and Internet-based environment and activities.

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
Review located information.	❖ In a GIS environment view, evaluate, and/or remove items (data references, reference document and events) returned from the search process. ❖ The user may navigate to on-line data references (URLs).	GC02. Browse/Search Results	(same)	(same)	❖ Facilitates analysis of potential land uses, opportunities, and alternatives for planning, environmental analysis and other decision making processes. ❖ GIS and Internet-based environment and activities
Communicate with interested parties and co-workers concerning tasks and problems; request information from the same.	❖ Create process to submit an event and/or add a new event category. ❖ NOTE: Specific events may be automatically triggered by other system events. Event Providers submitting events would have their stored account information pre-populated into the event submission form. Any Actor can become an Event Provider by establishing a provider account.	GC03. Submit Event	(same)	(same)	❖ Facilitate data exchange, permit pooling of resources ❖ GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
No Current, existing process.	System administration of errors related to events and triggered notifications including the resolution of errors involving subscription and event notification. Also resolve failed e-mail notification and remove outdated events. Approve requests for new event categories. NOTE: System automatically: ❖ creates a list of subscribers to be notified (by event category and spatial extent) by matching key criteria from the event and subscriber databases; ❖ sends e-mail notification to the appropriate subscribers; and ❖ logs communications and produces an event/notification error list.	GC04. Manage Event Notification Process	(same)	(same)	❖ Improve operational efficiency. ❖ Will automate communication among participants and customers. ❖ Automated process monitoring and control. ❖ Improve interoffice communication. ❖ GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
No Current, existing process.	Create process to establish or modify a data provider account or an event provider account (provider information).	GC05. Manage Provider Account	(same)	(same)	❖ Standardized, controlled participation methods. ❖ GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
Share data with interested persons via various media and in various formats.	Create process to submit index and catalog information for geo-referenced data, geo-related data and/or reference documents to GeoCommunicator. This includes: ▪ data reference (URL or physical location); ▪ relevant data catalog information (e.g. metadata); ▪ date; ▪ access restrictions; ▪ spatial reference; and ▪ spatial extent. NOTE: Provider may post product availability, restrictions, and subscriptions in the data catalog. NOTE: Providers will supply references to data housed in remote storage locations. This use case may include some security administration for restricted-access data sources.	GC06. Submit Data	(same)	(same)	Distribution and sharing of land Information to reduce costs and workload. Controlled data sharing. GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
No Current, existing process.	Create process to establish or modify subscriber account including: ❖ Actor information; ❖ Actor preferences; and ❖ Subscription/notification parameters (spatial extent, event categories, scheduling). NOTE: Browser may elect to become a new subscriber and pass current research scope information into the account setup.	GC07. Manage Subscriber Account	(same)	(same)	❖ Increase staff productivity through email notification of updated information, land activity and land related events ❖ GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
Maintain, store business data on paper, in data bases and in various record keeping systems.	System administration to: ❖ quality control (QC) data reference information; ❖ insert new/replacement data reference information; ❖ modify data catalog; or ❖ delete data references from the system. NOTE: Some providers will supply physical storage site/contact references to data rather than web site URLs. NOTE: Data submissions will be automated where possible.	GC08. Manage Data Process	(same)	(same)	❖ Improve quality control and support FGDC data content standards ❖ GIS and Internet-based environment and activities
No Current, existing process.	System administration of subscriber and provider accounts including: ❖ certifying new accounts; ❖ resolving errors; and ❖ managing account-related issues.	GC09. Manage Accounts	(same)	(same)	❖ Improve and maintain security. ❖ Monitor proprietary data. ❖ GIS and Internet-based environment and activities

GeoCommunicator Business Area					
Description of Current Process	**Proposed Change**	**New Business Process**	**Customers for Final Product from Process**	**Criticality of Process to Business Area**	**Expected Benefits**
Communicate with interested parties concerning data and tasks.	Create process to handle communication events : ❖ a topical forum (via e-mail); ❖ e-mail group (e.g. to review proposed data); ❖ data provider (e.g. to report errata); ❖ publish an information notice (e.g. an RFP, a Public Notice, or data discrepancy); or ❖ publish an information call (e.g. data request, reference request or event request). NOTE: Browsers may have limited communication access. Subscribers may have enhanced access to forums	GC010. Post Comment	(same)	(same)	❖ Provide functionality that compliments clearinghouse activity. ❖ Achieve significant increases in customer service. ❖ GIS and Internet-based environment and activities
Maintenance, recording of Communications by individual; group communications.	The System Administrator: ❖ sets up and closes communication forums, e-mail groups; ❖ monitors content; and ❖ manages errors.	GC011. Manage Forums	(same)	(same)	❖ Improved security. ❖ GIS and Internet-based environment and activities

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3.2.1 Tie Business Processes to the Bureau Architecture

See Appendix 7.

3.2.2 Business Process Improvement

The design methodology for GeoCommunicator is based entirely upon the Object Oriented Analysis and Design (OOAD) techniques which, in turn, are centered upon user involvement. The functional requirements for the Project were gathered in a series of GeoCommunicator workshops attended by users, technical experts, managers and consultants. Field visits were made to land management offices in the northwestern and the southeastern US to further explore unique business requirements. The requirements were then refined, i.e., analyzed for redundancy and overall relevancy. They were consolidated in a draft of the Concept of Operations and User Requirements document. Public meetings to review the document were held in Portland, OR, Denver, CO, Phoenix, AZ, Atlanta, GA and Washington, DC. Comments by the attendees of the review meetings were used to finalize and publish the document. It is available for viewing on the website, http://www.blm.gov/nils.

3.2.3 End Users/Customers

End users and customers are cadastral surveyors and land management specialists; for example, development planners, consultants, data stewards, assessors, case recordation specialists, recreation planners. Their employer may be the Federal government; state, county or city governments or private concerns. GeoCommunicator will serve any individual or organization whose primary data/information requirements are current, consistent and accurate parcel and survey data.

GeoCommunicator has been accepted by government and public cadastral communities as a much needed and pertinent effort to consolidate land management data and make it easily available. The positive response to the Project is apparent from the activity on the website, the requests for presentations and the attendance at the public review meetings.

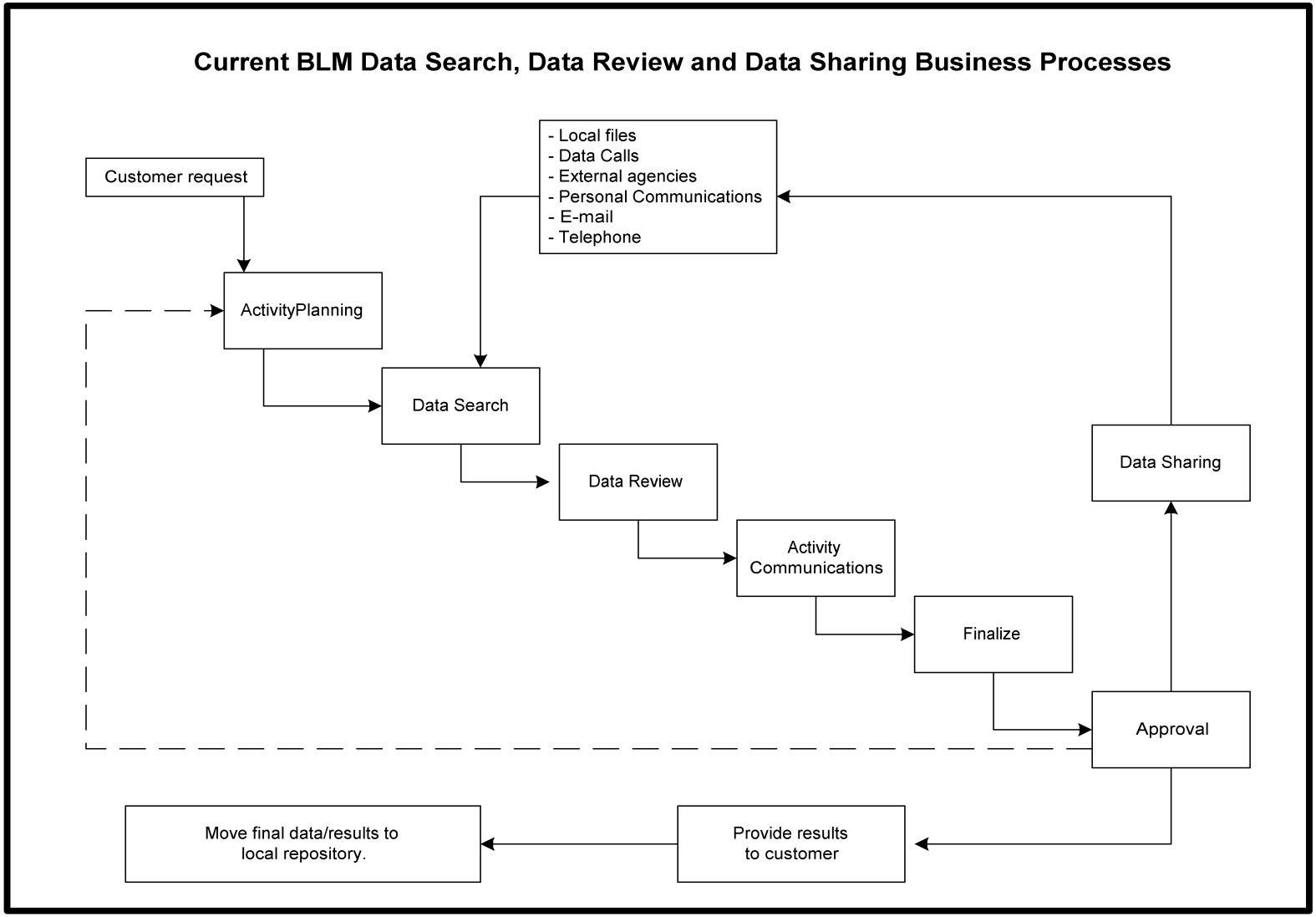
The functional requirements for GeoCommunicator were gathered with the assistance of subject matter experts at the user level. During the Analysis and Design phase, user involvement would be solicited in the same manner as a means to identify any shortcomings and to create a product which serves the needs of the customer.

3.2.4 Other Business Areas/Programs

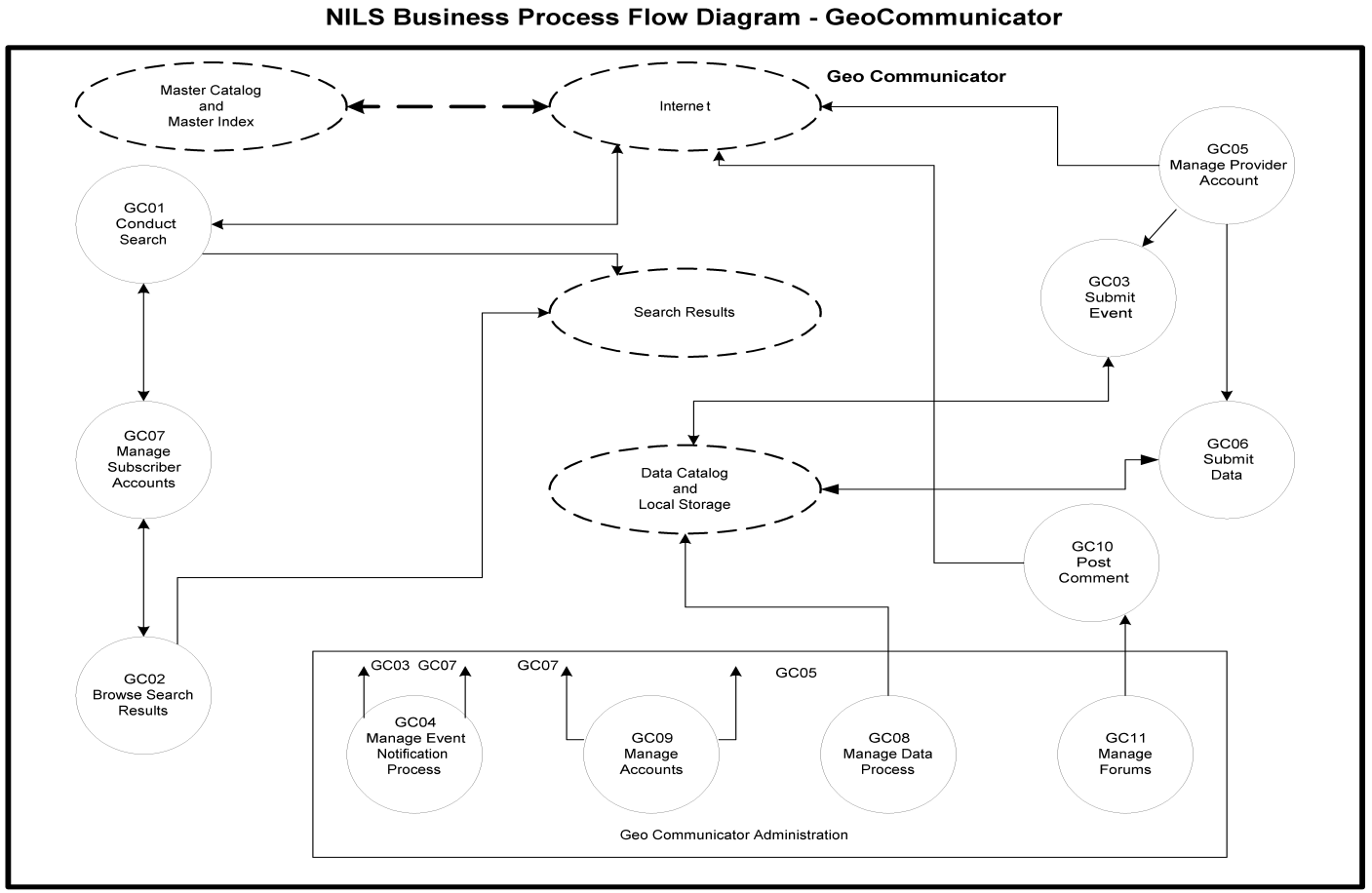
Since the GeoCommunicator is a module directed at creating an efficient means of sharing and providing land data and information, it will integrate with the business processes and activities of the BLM because BLM's functions are land based. This also pertains to other agencies and organizations involved in land management.

3.3 High Level Business Process Flow Diagrams

3.3.1 Target Process Flow Diagram


Current BLM Data Search, Data Review and Data Sharing Business Processes
Customer request
- Local files
- Data Calls
- External agencies
- Personal Communications
- E-mail
- Telephone
ActivityPlanning
Data Search
Data Review
Activity Communications
Finalize
Approval
Data Sharing
Move final data/results to local repository.
Provide results to customer

3.3.2 GeoCommunicator Process Flow Diagram



3.4 Data Management Documentation

3.4.1 High Level Data Groups

3.4.2 Data Sources

Data sources for GeoCommunicator would be from participating agencies and offices in all levels of government and private concerns. Data will consist of cadastral and land management information – surveys, GIS coverages, scanned documents, plats, text documents, PLSS, coordinate sets and planning resources.

3.4.3 Data Sharing

Users and customers would receive and disseminate land information within the cadastral community using the GeoCommunicator GeoCommunicator would provide the business processes necessary to communicate land-related activities and data over the Internet. Consumers of spatial information may use GeoCommunicator to discover:

- data and activities related to their personal area of interest (e.g. a state or county) and how to access the information,
- geographic extent of specific data and activities (e.g. Public Land Survey coordinate data sets, planned field survey projects) linked to the land and how to access that information.

Providers (GeoCommunicator customers/end users) of spatial information describe would link their data and activities into a searchable index, locate their geographic extents on a map interface, and enable information flow through email contact and links or paths to existing data stores. The GeoCommunicator would also be used to coordinate ongoing information and establish a system where agencies and people that download information from the Internet can have a sense of updates and notifications related to that data.

3.4.3.1 Data Exchange Agreements

Prior to implementation of GeoCommunicator, no data exchange agreements would be in place. Future agreements among cooperators may be necessary and appropriate but are unknown at this time.

3.4.3.2 Meta-Data Standards

GeoCommunicator; will follow the FGDC (Federal Geographic Data Committee) metadata

standard; it will use this standard to build its metadata files

3.4.3.3 Data Contacts

GeoCommunicator would be used by all levels of BLM offices. Data stewards would be persons/officials in each office who are responsible for administration of the data.

3.5 Maximizing the usefulness of the information within the System

The common data model of NILS would contain information about the BLM's (and others) land; it would contain land information assimilated from many existing systems. One data model would efficiently, accurately and consistently make use of land data used in the BLM's business processes. For customers internal and external to the BLM, by using GeoCommunicator, information would be more readily available. The time to gather data for internal and external reports, etc. would be greatly reduced if it were available from a common source and not researched from among several offices and then analyzed and reformatted before distribution. Integrity of the data would be enhanced.

3.6 Coordination with State, Local and Tribal Governments

National Integrated Land System
Public Outreach and Communication

February 2001

The National Integrated Land System (NILS) has made a conscious effort to gather requirements and inform the public of the NILS project through public meetings, workshops, presentations at user group meetings, and through the Internet. The NILS goal is to get as much user involvement from the widest audience as possible. This includes involving users through out the United States from the Federal, State, local and regional governments, and from the private sector. The NILS public outreach activities are summarized below.

Requirements Gathering and Review Workshops
The goal of the business requirements workshops was to develop cadastral and land requirements for Survey Management, Measurement Management, Parcel Management, GeoCommunicator, and the components of NILS. High-level business requirements and detailed analysis workshops are held through out the year at various locations to gather and refine requirements, to develop and review design specifications and prototypes, etc.

Representative users are:
- BLM (AK, AZ, CA, CO, OR, MT)
- Forest Service (AZ, CO, GA, OR, WO)
- Boulder County

- Salt Lake County-UT
- Polk County-OR
- Oakland County-MI
- Pinal County-AZ
- Maricopa County-AZ
- State of Arizona
- State of Washington
- Private industry
- University of Maine

Site Visits

The purpose of the site visits was to verify the requirements use cases with the business processes from the State, Federal, and County agencies in the Pacific Northwest and in the Eastern United States on their survey, record management, and GIS business practices. The information was used in the validation of the business process requirements being gathered for the National Integrated Land System (NILS).

The following sites were visited:

- BLM Oregon State Office Portland, OR
- Forest Service Region 6 Portland, OR
- Polk County, OR
- Washington State Dept. of Natural Resources Olympia, WA
- Thurston County, WA
- Forest Service Region 2 Atlanta, GA
- TVA Chatanooga, TN
- Fulton County, GA
- State of Florida Tallahassee, FL

User Group Meetings and Presentations

The purpose of the presentations is to give an overview of the NILS project, and to inform the general public of where and how to comment on any aspects of the project. NILS project overviews were conducted at the following meetings:

- National Association of Counties, St. Louis, MO (July 1999)
- Utah GIS Council Conference, Snowbird, UT (Sept. 1999)
- GIS in the Rockies Conference, Denver, CO (Oct. 1999)
- FGDC Group, Washington, DC (Oct. 1999)
- SWUG Conference Breckenridge, CO (Oct. 1999)
- National States GIS Council, New Orleans, LA (Aug. 1999)
- BIA Denver, CO (Feb. 2000)
- IRMAC (Mar. 2000, Aug. 2000)
- Western Governors Association Meeting, UT (March 2000)
- Arizona Professional Land Surveyors (ALPS) Show Low, Kingman, Benson, Tucson, and Phoenix, AZ (2000)
- ESRI User Conference San Diego, CA (1999, 2000)

- BLM GIS Phoenix, AZ (April 2000)
- Integrating GIS and CAMA, Miami, FL (April 2000)
- BLM Wyoming State Office (July 2000)
- Fluids conference (July 2000)
- DOI Information Technology Conference, Denver, CO (October 2000)

NILS requirements review presentations were conducted at the following meetings:
- Geographic Coordinate Database (GCDB) Technical Advisory Group (GTAG) at the University of Maine in Orono-ME (Sept. 1999),
- Southwest Users Group Breckenridge-CO (Oct. 1999),
- GCDB Management & FGDC Cadastral Subcommittee Billings-MT (Nov. 1999)
- BLM and US Forest Service Lands Group Billings, MT (Nov. 1999).

NILS Public Meetings

Public meetings were conducted in five cities across the country to present the draft *Concept of Operations and Business Process Requirements Document*. Announcement of the meetings was sent to all public agencies in the area via mail, E-mail, and through the Internet via the NILS web site. The goal of the public meetings was to inform the public of the NILS project, to present the requirements document, and to solicit comments. The public meetings were held in:
- Portland, OR
- Phoenix, AZ
- Denver, CO
- Atlanta, GA
- Washington, DC

One hundred eighty nine people attended the public meetings. Sixty-five organizations were represented. The number of participants by organization type is as follows:

City	4
County	16
Federal Agency	116
BLM	48
MMS	2
National Geodetic Society	3
NPS	8
NSZ	3
USACE	1
USBOR	9
US Census Bureau	1
USOSM	1
Farm Service Agency	1
USFS	13
USFWS	19
USGS	7
Non-profit Assoc./Organ.	3

Private Firm	32
Regional Government	2
State Agency	13
Tribe	1
University/College	2

Comments have been received on the draft *Concept of Operations and Business Process Requirements Document* as follows:

- 12 comments received on-line
- 21 comments received through E-mail/US mail

Internet/Intranet

The National Integrated Land System Project maintains two web sites to keep the general public, BLM employees, and NILS partners up-to-date on all activities related to the project. The NILS Internet site is located at http://www.blm.gov/nils and the Intranet site is located at http://web.blm.gov/lris/nils. The NILS Internet web site has received 5,800 visits since January 2000.

The NILS web site contains planning documents, a calendar of activities, meeting/workshop notes, informational slide shows, business requirements, detailed analysis specifications, comment forms, links, etc. The public can register on-line, through the mail, or by phone as an interested party, as a vendor of products and services, or to submit comments. New and updated project information is put on the web site, as it becomes available. Mass mailings through E-mails and the general mail are made periodically to inform the registered parties and partners of new and updated information, to review detailed requirements specification, to inform them of public meetings, and to requests comments.

The NILS project used Team Room to develop a forum and place to archive documents for the development of GeoCommunicator. Team Room was used to communicate between team members from different agencies and the public; to announce meetings; to display meeting notes, project design, and PowerPoint mockups; to gather comments; and to hold discussions.

NILS continues to use all methods necessary to inform the public and team members and to seek their involvement at all levels in the project.

3.7 System Accessibility

See Section 4.2, Requirements Description.

4.0 Target System Requirements

4.1 Supporting Documents

Document Citation	Date	Information Content	On web site?
COURS	3/20/00	Project Requirements	www.blm.gov/nils
Computer application program accessibility	1/13/98	GSA ADA requirements	www.itpolicy.gsa.gov/cita
GeoCom Workshop Notes	6/14/99	Additional System requirements	www.blm.gov/nils

4.2 Requirements Description

Functional category	Functional Requirement	Description
Human factors and ADA	Every graphic image should have associated text	Use the html tag: *ALT=* Person is using a character based program or has browser graphics turned off
	Include detailed descriptive "comments" with all jpeg images	Use a jpeg file editor to include information in the "comments" section of the jpeg file
	Make link text descriptive but not verbose (e.g. "this", "here" or "click")	Use words that convey content
	Include a HTML document version of PDF files	Pdf files are strictly graphic in nature
	Provide alternative mechanism for on-line forms	Forms are not supported by all browsers
	For simple images, such as icons performing the function of bullets, use simple ALT attributes	Use the HTML tag: *ALT="0"* or use an "*" for performing functions of bullets
	Do not make use of extensions to the HTML standard (e.g. "blink")	The HTML tag: *BLINK renders* Braille and speech display systems useless
	Color coding is not to be used as the only means of conveying information or indicating an action	An alternative method that can be used by individuals who do not possess the ability to identify colors must be provided
	System display will support 80% of screen size in use today on the internet	GeoCom screen designs will accommodate 800x600 pixel Screen size
Security	Password control and aging, Use of user ID for access	Password length, structure, number of reuse, length before requiring change is to be used
	Display of privacy act and disclaimer statements	USDOI statements to be used on the Internet Home page
	Make Use of standard security controls for the web server	Use of Virus Detection software and intrusion detection software for the web server, logging of events

Functional category	Functional Requirement	Description
	QA/Audit support	GeoCom tools will provide QA support, communication and email failure logs shall be employed
System Interfaces	System must work with Lotus Notes	Lotus Notes provides the GeoCom forum and provides the email notification facility
	System must work with the ESRI suite of GIS software	ESRI software is the BLM standard for GIS applications
	Browser compatibility is to be maintained for the two most popular browsers	System must work with Internet Explorer 5+ and Netscape 4.5+
Standards compliance	FGDC data content standard is to be followed	GeoCom will use this standard to build its metadata files
	NSDI spatial standard is to be followed	GeoCom will use this standard to maintain its index and data and activity footprint layers
System performance	Performance controls shall be employed	GeoCom servers shall have performance monitors installed, long queries shall be queued by the ArcIms and ArcSDE software
Database Management	Manage Data and Subsets	Find and manage files; select, create subsets, merge, append data.
	Manage Data Properties and Relationships	Edit properties of selected data.
	Administer Access Rights	In mulit-user environment, maintain passwords and database security.
	Transactions and Versioning	Manage locking, commits, rollbacks, version conflicts
	Data Automation Support	Provide tools which support migration from existing databases to the NILS data schema ; support digitizing, scanning, manual data entry.
	Import/Export	Ability to share data in various formats.
Geographic Informations Systems	Map Data and Display	Display, pan zoom, modify, select, annotate feature-level geometry.
	Query	Search for and refine selected features and feature sub-sets.
	Analysis	Spatial, logical, boolean, mathematical analysis.
	Reporting and Plotting	Create text reports, map plots of specialized cadastral/land management information.

5.0 Target System Architecture

5.1 Supporting Documents

Document Citation	Date	Information Content	On Web Site?
BLM IT Architecture Study	March, 2000	BLM IT requirements, business structure and future direction.	Soon to be posted.
BLM Strategic Plan	March, 2000		
BLM Enterprise Architecture	March, 2000		

5.2 Planned Architecture

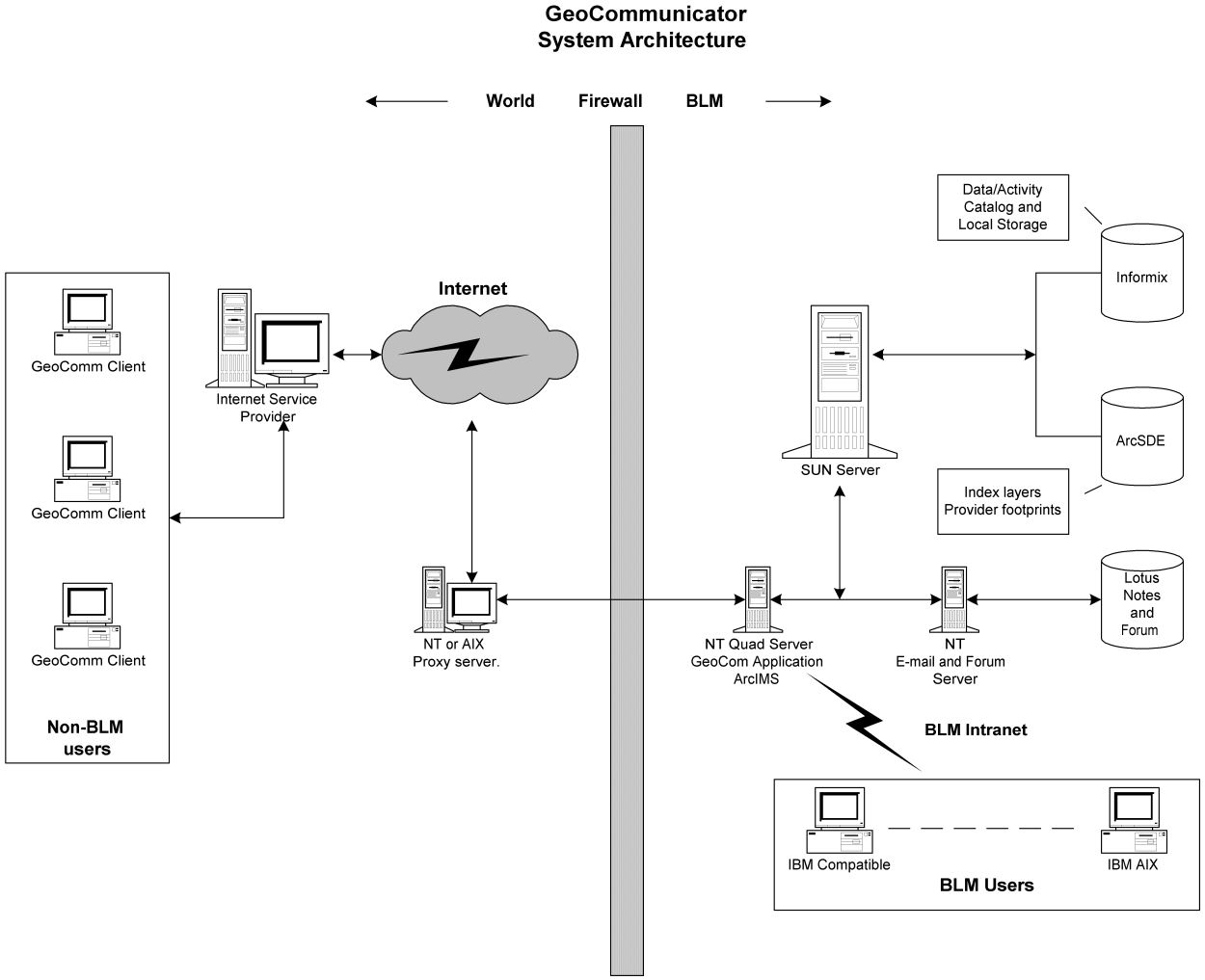
5.2.1 Operational Architecture

5.2.1.1 Existing System

The existing BLM hardware architecture configuration consists of IBM AIX, NT, Macintosh and SUN platforms. Server configurations incorporate the SUN E10K as the Bureau enterprise server, AIX J50's as departmental servers and NT's as the workgroup servers and desktop clients. There are presently 684 servers Bureau-wide and 9362 desktops of which 3000 are IBM AIX, 6800 NT's, 500 Novell and 500 other platforms. BLM's State and Field Offices are operating a 10/100 megabit LAN within the office, 56K to 1.5 megabit WAN, 56K WAN between State and Field Offices, 1.5 Megabit between State Offices and the World Wide Web backbone.

No changes to overall Bureau architecture would be required to support GeoCommunicator. GeoCommunicator applications would be built upon existing COTS, GIS software. New hardware and software requirements would be fulfilled by spreading new purchases among other proposed and existing projects (RTSS, GCDB). Required COTS packages would be shared resources.

5.2.1.2 Proposed System


GeoCommunicator
System Architecture
World
Firewall
BLM
Data/Activity
Catalog and
Local Storage
Informix
ArcSDE
Index layers
Provider footprints
Lotus
Notes
and
Forum
Internet
GeoComm Client
GeoComm Client
GeoComm Client
Non-BLM
users
Internet Service
Provider
SUN Server
NT or AIX
Proxy server.
NT Quad Server
GeoCom Application
ArcIMS
NT
E-mail and Forum
Server
BLM Intranet
IBM Compatible
IBM AIX
BLM Users

5.2.1.3 Modified Components:

The hardware/software requirements required of a GeoCommunicator application installation are listed in the following table). As stated in 5.2.1.2, these items would be shared with other projects**.**

Architecture Components Required by GeoCommunicator client.

Required Component	Characteristics	Location	Source/Own-ership
NT workstation	Desktop computing environment	Local to office implement-ing NILS.	Provided by local office.
Microsoft Office Professional	Business tools		
Web Browser	Basis for GeoCommunicator		

Architecture Components Required by GeoCommunicator Process Server and Web Server.

Required Component	Characteristics	Location	Source/Own-ership
Lotus Notes	Inter-office communication	BLM, NIRMC	BLM
ESRI ARC INFO, Ver. 8	GIS environment to support NILS land management tools		
Database engine (Informix)	Store for NILS data model		
NT Server Operating System	Internet Information Server MS Transaction Server		
ESRI SDE	Data serving software.		
LAN/WAN/Internet	Provide transmission media for data sharing and communication		
ESRI Internet Map Server	Functionality to provide GIS products (maps) to the Internet.		
Data Server *	Runs ArcSDE and Informix		
GeoCommunicator Web Server *	Portal host		
Proxy Server *	Proxy Service		
GeoCommunicator Process Server *	Map and Query services		
Administration Workstation	Admin. and Data management tools		

* May be hosted on single machines or distributed across multiple servers.

5.2.2 Development Environment

The development site is at ESRI (Environmental Research Systems Institute) in Redlands, CA.

The development architecture consists of Microsoft Internet Information Server, ArcSDE (Spatial Data Engine), ArcIMS (Internet Map Server), Lotus Notes and Informix databases. GeoCommunicator hardware components include NT and SUN servers.

5.2.3 Test Environment

Functional testing would take place at various remote locations via the Internet. Client workstations would include IBM-compatible PC's running NT, Win98 and Win95; and IBM UNIX workstations running AIX.

5.2.4 Training Environment

GeoCommunicator would incorporate an on-line tour to provide training documents to its users. In addition, a TDM (Training Desk Manual) which enhances the on-line tour, would be provided would be provided to users. The manual would provide BLM-related, system use examples.

5.2.5 Back-Up and Recovery Architecture

The GeoCommunicator system would be included in the NIRMC standard backup procedures. It would include daily backups of all changed files and weekly backups of the entire system. Off-site storage of the backup media would be required. The Security Plan contains details of the recovery strategy.

6.0 Master Plan and Schedule

6.1 Implementation Plan for Project

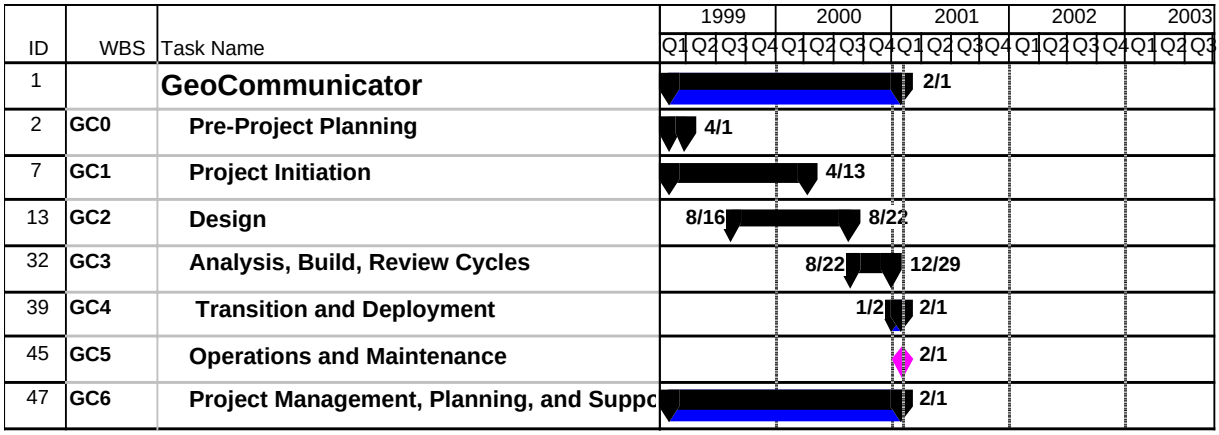
6.1.1 Roles and Responsibilities

Provide the names of Bureau employees assigned to each of the following key project roles:

Key Project Roles	Name	Phone	Email Address
NILS Project Manager	Leslie Cone	303-236-0815	Leslie_Cone@ blm.gov
NILS Deputy Project Manager	Chris Hamilton	303-236-6539	Chris_Hamilton@ blm.gov
NILS Technical Lead	Roy King	303-236-2628	Roy_King@ blm.gov
Staff Lead - GeoCommunicator	Jerry Sullivan	303-236-1089	Jerry_Sullivan@ blm.gov
Subject Matter Expert Lead - GeoCommunicator	Brent Blair	503-952-6177	Brent_Blair@ blm.gov
NILS GIS Specialist	John Reitsma	303-236-1984	John_Reitsma@ blm.gov

6.1.2 Project Schedule

6.1.2.1 High Level Gantt Chart



6.1.2.2 Detailed Gantt Chart

See Appendix 1.

6.1.3 Project Activities -- Work Breakdown Structure

6.1.3.1 Summary Work Breakdown Structure

ID	WBS	Task Name	Duration	% Complete	Start	Finish
1		**GeoCommunicator**	**509 days**	**74%**	**Mon 2/1/99**	**Thu 2/1/01**
2	**GC0**	**Pre-Project Planning**	**43 days**	**100%**	**Mon 2/1/99**	**Thu 4/1/99**
7	**GC1**	**Project Initiation**	**306 days**	**100%**	**Mon 2/1/99**	**Thu 4/13/00**
13	**GC2**	**Design**	**257 days**	**100%**	**Mon 8/16/99**	**Tue 8/22/00**
32	**GC3**	**Analysis, Build, Review Cycles**	**89 days**	**95%**	**Tue 8/22/00**	**Fri 12/29/00**
39	**GC4**	**Transition and Deployment**	**23 days**	**20%**	**Tue 1/2/01**	**Thu 2/1/01**
45	**GC5**	**Operations and Maintenance**	**0 days**	**0%**	**Thu 2/1/01**	**Thu 2/1/01**
47	**GC6**	**Project Management, Planning, and Suppc**	**509 days**	**68%**	**Mon 2/1/99**	**Thu 2/1/01**

6.1.3.2 Detailed Work Breakdown Structure

See Appendix 2.

6.1.4 Key Milestones and Products

Milestones	Product/Goal
Partnership Agreement	
Completion of Requirements Document	Concept of Operations and user Requirements document.
Completion of Design	GeoCommunicator Prototype
Completion of Analysis, Build, Review Cycles	Final GeoCommunicator product
Transition and Deployment of GeoCommunicator	GeoCommunicator deployed
Operations and Maintenance	Evaluate and mitigate required support levels.
GeoCommunicator close-out	Project Completion

6.1.5 Resource Requirements

6.1.5.1 Detailed Resource Requirements

Resource	Title/Position	Commitment
Leslie Cone	NILS Project Manager	10%
Chris Hamilton	NILS Deputy Project Manager	10%
Janet Beavers	Admin. Assistant	100%
Roy King	NILS Technical Lead	100%
Ginny Pyles	Domain Staff Lead	100%

6.1.5.2 Future Resource Requirements

Future resource requirements would be defined by evaluations conducted during the Operations and Maintenance phase of the project.

6.2 Project Justification and Investment Management

6.2.1 Project Justification

Data collection among all levels of government, non-profit organizations and private industry continues at a pace that exceeds our ability to track collection of similar data, share data or form partnerships to cooperatively collect and maintain data. Common data standards have been established, yet do not insure common access or collection partnerships. A significant amount of this data is information related to a point or area on the earth's surface. As data requirements and the demand for land-related information increase, the magnitude of these shortcomings will escalate.

The GeoCommunicator would be a solution: Through an Internet-hosted graphic map interface, a customer would discover what information is available or planned for collection within a selected geographic extent across multiple data sources. The customer would discover the geographic extent of a specified type of existing information and see locations of planned activities concerning that type of data. Access to data stores would be provided through the Internet's URL links or through points of contact. An automated notification service would be offered that would alert the customer to modifications and/or additions to certain types of information and specified activities within a selected geographic extent.

With GeoCommunicator, users and customers would have an efficient, standard means of data sharing, task/project planning and communication. Missing data, inconsistencies and inaccuracies would be minimized; timeliness in reporting, customer satisfaction and customer confidence would increase.

6.2.2 Return on Investment Summary

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3		**Total**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
4	**Shared Costs**		$0.00	$0.00	$28,235.52	$28,235.52	$28,235.52	$28,235.52	$28,235.52	$28,235.52	$28,235.52
5	**Project Costs**		$482,589.38	$426,931.26	$150,093.60	$96,398.00	$99,175.29	$102,035.89	$104,982.31	$108,017.12	$111,142.98
6	**Total Costs**		$482,589.38	$426,931.26	$178,329.12	$124,633.52	$127,410.81	$130,271.41	$133,217.83	$136,252.64	$139,378.50
7	System Life Cost	$1,879,014.47									
8	Present Value Cost	$1,768,845.61	$482,589.38	$415,707.17	$169,075.77	$115,059.78	$114,531.38	$114,024.16	$116,603.11	$119,259.43	$121,995.43
9	Residual (Salvage) Value Factor	0.000									
10	Discounted Residual Value	$0.00									
11	Adjusted Cost	$1,768,845.61									
12											
13	**Total Tangible Benefits**		$0.00	$247,011.94	$254,422.30	$262,054.97	$269,916.62	$278,014.12	$286,354.54	$294,945.18	$303,793.53
14	System Life Benefits	$2,196,513.20									
15	Present Value Benefits by Year		$0.00	$240,517.96	$241,220.54	$241,925.18	$242,631.87	$249,910.83	$257,408.15	$265,130.40	$273,084.31
16	Total Present Value Benefits	$2,011,829.24									
17	Net Present Value	$242,983.64									
18	Benefit/Cost Ratio	**1.1**									
19	Discounted Cumulative Benefits		$0.00	$240,517.96	$481,738.50	$723,663.68	$966,295.55	$1,216,206.38	$1,473,614.53	$1,738,744.93	$2,011,829.24
20	Discounted Cumulative Costs		$482,589.38	$898,296.54	$1,067,372.32	$1,182,432.10	$1,296,963.48	$1,410,987.64	$1,527,590.75	$1,646,850.18	$1,768,845.61
21	Payback Differences		-$482,589.38	-$657,778.59	-$585,633.82	-$458,768.42	-$330,667.93	-$194,781.26	-$53,976.21	$91,894.76	$242,983.64
22	Payback Period	**2007**									
23											
24	**Present Value Factor**	0.027									

6.2.2.1 Tables Summarizing Return On Investment Data

See Appendix 3.

6.2.2.2 Scope of ROI Analysis and Assumptions

See Appendix 4.

6.2.2.3 Costs and Benefits

See Appendix 5.

6.3 Sensitivity Analysis

Resource Risk	Description
Development cost increases by factor of 2	Current estimate is calculated at 15% of NILS allocation of funds for the development phase, 30% reduces the ROI ratio to 1.0
Project runs 6 months longer than projected	Project management costs for BLM and Contractor for 6 additional months reduces the ROI ratio to 1.0
Yearly shared costs double	ROI ratio reduces to 1.0

6.4 Risk Identification and Management

6.4.1 Risk identification

RISK	MITIGATION
Dedicated technology lead from BLM is required	BLM person assigned
Decentralized data conversion effort	QA analysis program; data content standard; GCDB; subsequent enforcement
Missing fundamental user requirements	OOAD process to guide design; user participation in developing requirements.
Late, infrequent deliverables to illustrate progress	Project web site, iterative prototyping; communications plan
Lack of support and/or acceptance because of perceived insufficient input from multiple levels of users	Publicity and support drive, communication plan (outreach program)

RISK	MITIGATION
Tools do not enforce data model standard and business rules effectively	Methods and behavior inherent in Arc 8 geo object data model, Iterative Prototyping
System not capable of aggregating and splitting land units properly	Design of Use Case functionality for 'Integrate Non-Survey Data', 'Parcel Construction', etc.
Changes in business rules mandated by legislation.	Re-usable software components; versioning; extensibility.
Freedom of Information Act mandates.	Re-usable software components; versioning; extensibility; adaptable security measures.
Software and procedures unfamiliar to users.	Training plans; web-based training; site-specific training programs.

6.4.2 Risk Management Summary Spreadsheet

See Appendix 6.

Appendix 1 Detailed Gantt Chart

Appendix 2 Detailed Work Breakdown Structure

Appendix 3. Summary of Return on Investment Data

Appendix 4. Return on Investment Assumptions

Appendix 5. Costs and Benefits

Appendix 6. Risk Management Summary Spreadsheet

Priority	Risk Statement	Project Phase	Assigned to:	Overall Risk Rating
1.	Dedicated technology lead from BLM is required	All	NILS Staff	***Risk eliminated*** ***Date : xx/xx/xx***
2.	Decentralized data conversion effort	All	NILS Staff	***Risk static*** ***Date : xx/xx/xx***
3.	Missing fundamental user requirements	All	NILS Staff	***Risk decreasing*** ***Date : xx/xx/xx***
4.	Late, infrequent deliverables to illustrate progress	All	NILS Staff	***Risk eliminated*** ***Date : xx/xx/xx***
5.	Lack of support and/or acceptance because of perceived insufficient input from multiple levels of users	All	NILS Staff	***Risk eliminated*** ***Date : xx/xx/xx***
6.	Tools do not enforce data model standard and business rules effectively	All	NILS Staff	***Risk decreasing*** ***Date : xx/xx/xx***
7.	System not capable of aggregating and splitting land units properly	All	NILS Staff	***Risk decreasing*** ***Date : xx/xx/xx***
8.	Changes in business rules mandated by legislation.	All	NILS Staff	***Risk static*** ***Date : xx/xx/xx***
9.	Freedom of Information Act mandates.	All	NILS Staff	***Risk static*** ***Date : xx/xx/xx***
10.	Software and procedures unfamiliar to users.	All	NILS Staff	***Risk static*** ***Date : xx/xx/xx***

Appendix 7. Business Process Tie to Bureau Architecture